

## Comparison of Recurrence Rate of Wrist Ganglion Between Seton and Open Surgical Excision in Military Hospitals of Pakistan

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### ABSTRACT

**Objective:** To evaluate the recurrence following open surgical excision and Seton placement in treating symptomatic wrist ganglions in Military Hospitals in a six-month follow-up study.

**Study Design:** Quasi-experimental study

**Place and Duration of Study:** Department of General Surgery, Combined Military Hospital, Bahawalpur Pakistan, Combined Military Hospital, Dera Nawab Sahib Pakistan and Pakistan Airforce Force Hospital, Shorkot Pakistan, from Jun 2015 to Dec 2020.

**Methodology:** The patients were divided into two groups after informed consent. A consultant general surgeon carried out every procedure. The findings were recorded on a uniform proforma, and recurrence was recorded at ten days, six weeks and six months for both groups.

**Results:** The mean age of the patients was 29.45±8.13 years in Group-A (Seton-Group) and 28.56±8.32 years in Group-B (Open-Surgery). There was no difference in the recurrence rates between the Seton-Group (n=7, 4.35%) and Open Surgery-Group (n=2, 4.65%, p=0.931).

**Conclusion:** Seton insertion for treating Ganglions of the wrist is a simple, economical and cosmetic procedure which can be done in the outpatient department. It is a safe alternative to open resection for successful treatment of the wrist Ganglion.

**Keywords:** Ganglion, Open surgery, Recurrence, Seton, Wrist.

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### INTRODUCTION

Ganglion cysts are frequently encountered and common swellings in surgical practice, with dorsal wrist ganglions constituting 60-70% of cases.<sup>1</sup> They have a prevalence of 55/100,000 in the UK with 3:1 female preponderance. It mostly affects 20-40 years old but is also found in children and the older population.<sup>2</sup>

The asymptomatic ganglion is treated by reassurance, whereas aspiration and surgery are the two options for symptomatic ganglions. Both open and arthroscopic surgeries are used, but they are associated with post-operative pain, joint stiffness, unacceptable scar and a definitive chance of recurrence despite meticulous surgical technique.<sup>3,4</sup> Meticulous and radical surgery reduces the chances of recurrence. However, there is a corresponding increase in other complications, including injury to the radial artery in volar wrist ganglion, chronic wrist pain and restriction of joint movements post operatively.<sup>5</sup>

Aspiration (or extrusion) is one option as it is diagnostic and therapeutic in many cases and is used as a primary mode of treatment in NHS, where surgery is reserved for severe cases.<sup>6</sup> The aspiration results are variable, and different techniques have been adopted to reduce the recurrence rate. Intralesional steroid injections or hyaluronidase are given after aspiration with mixed recurrence rates.<sup>7</sup> Similarly, the contents have also been reported to be drained with the help of a suture material passed through the ganglion, hoping that it will also result in fibrosis in addition to drainage.<sup>8</sup> This procedure was first described by R. Gang and S. Makhoulouf in 1988 and has been called the Thread technique, Trans-fixation suture or Seton in the literature.<sup>9</sup>

Recurrence rate with surgery is less (15%) but causes chronic wrist pain, leading to endless excuses from pushups in some soldiers.<sup>10</sup> Seton placement is time-saving, economical, and convenient. An easily mastered technique which can be conveniently carried out in minor Operation Theatre (OT) even by a General Practitioner.<sup>5</sup> This is beneficial for patients owing to the decreased morbidity, complications and waiting

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time for surgery, especially in the COVID-19 scenario wherein many other elective cases have piled up on top of allowing the OT to be reserved for more important cases. Thus, this study aimed to compare open surgery with Seton treatment for wrist ganglions in three military hospitals in Pakistan.

## METHODOLOGY

The quasi-experimental study was conducted Department of General Surgery, Combined Military Hospital Bahawalpur, Combined Military Hospital, Dera Nawab Sahib and Pakistan Air Force Hospital, Shorkot Pakistan, from June 2015 to December 2020. The approval was sought from the Hospital ethical committee vide PNS Rahat IRB No. 001/2021 dated 17th June 2021. Non-probability convenience sampling technique was used.

**Inclusion Criteria:** Patients aged 18 years and above presenting with symptomatic ganglions of the wrist, greater than 7mm for the first time were included in the study.

**Exclusion Criteria:** Patients with recurrent ganglions, compound palmar ganglion, joint disease, previous wrist surgery, diabetes, eczema or skin disease of the procedure site or any other immunocompromised state (chemotherapy, malnutrition BMI <18, Steroid intake), patients with a history of allergy to Lignocaine local anaesthesia (LA) were excluded from the study.

Patients were divided into two groups, Group-A (Seton-Group) and Group-B (Open Surgery), by lottery method. Results were compared for any bias due to the operating surgeon. A total of 161 patients were included in Group-A and 43 in Group-B. All the patients were briefed about the nature of the disease and both therapeutic options. Informed consent regarding the procedure and participation in the study was obtained. The Seton was invariably passed under LA, whereas the choice of anaesthesia for open surgery was at the discretion of the operating surgeon to excise the ganglion satisfactorily.

The symptomatic ganglion was the one which was causing pain. The severity of pain was recorded on a Visual Analogue Score (VAS) on presentation with "0" meaning "No Pain" and "10" meaning maximum possible pain.<sup>11</sup> Other features were a cosmetic concern, decreased grip strength, paresthesia, restriction in range of movement, or suspicion of a tumour. Patients having a single ganglion were selected. The duration of the lump, site (dorsal versus volar), side and size as measured by a ruler (Vernier

calliper) were recorded. A consultant general surgeon did every procedure with similar experience.

The successful outcome of the procedure was the disappearance of the lump at the end of the six-month follow-up, and the findings were recorded on day 10, six weeks and six months. Seton was invariably passed under LA in Minor OT. The area was prepared with an alcohol swab for LA. A 2% Lignocaine injection with adrenaline was used for LA in an insulin syringe and was usually sufficient to numb the area. A Silk 1 suture (Ethicon MERSILK 1 on a 31mm<sup>1</sup>/<sub>2</sub>c round bodied needle with a length of 75cm) was passed under an aseptic technique through the anaesthetized skin after stabilizing the ganglion with the other hand. The contents of the ganglion were extruded out, and the clear jelly-like fluid was reassuring and diagnostic that the Seton had passed through the ganglion. The thread was kept loose and used for tying a small bandage over the ganglion. The needle was passed a second time if the ganglion did not disappear completely because some ganglions are multiloculated. A crepe bandage was tied over the ganglion, and the patient was advised to review for a change of dressing on the second post-operative day. Tablet Co-Amoxiclav 625mg 8-hourly (or Tablet Trimethoprim-Sulfamethoxazole 800mg/160mg twice daily if the patient was allergic to Co-Amoxiclav) and Tablet Acetaminophen 500 mg 8 hourly or Tablet Diclofenac Sodium 50mg 12-hourly were advised for three days. The patients were encouraged to move their fingers but were advised to avoid wrist movements. Patients were advised to review for a dressing change on the second post-procedure day. They were advised to apply a crepe bandage for the next week. The Seton was removed on the tenth day, and findings were recorded. Similar findings were recorded at six weeks and six months.

In Group-B, open surgical excision was done after giving appropriate anaesthesia in each case. The procedure was carried out in the OT under strict aseptic conditions. The patients operated on under LA were sent home on the same day with a recommendation of complete bed rest for three days. The patients receiving GA (General Anesthesia) or regional anaesthesia were admitted overnight and given rest accordingly. Tourniquet was used in selected cases to achieve satisfactory excision. The patients were given crepe bandages and encouraged to move their fingers. A triangular sling was also given for the first three days. Sutures were removed after seven days.

Statistical Package for Social Sciences (SPSS) version 21.0 was used for the data analysis. Frequencies and percentages were calculated for categorical variables. Mean and standard deviation were calculated for quantitative variables. Chi-square test was applied to find out the association. The *p* value of  $\leq 0.05$  was considered statistically significant.

**RESULTS**

A total sample of 204 patients was included in the study. There were 161(78.9%) patients in Group-A and 43(21.1%) in Group-B. The mean age of presentation was  $29.26 \pm 8.16$  years. 113(55.39%) patients had right-sided ganglions, whereas 91(44.61%) were left-handed. Dorsal wrist ganglions constituted 160(78.43%), and volar ganglions were 44(21.57%) in number (Table).

**Table: Clinical Characteristics in Group A and B (n=204)**

Variables	Groups		p-value
	Group-A Seton (n=161)	Group-B Open Surgery(n=43)	
<b>Side</b>			
Right	92 (57.1%)	21 (48.8%)	0.330
Left	69 (42.9%)	22 (51.2%)	
<b>Site</b>			
Dorsal	126 (78.3%)	34 (79.1%)	-
Ventral	35 (21.7%)	9 (20.9%)	
<b>Gender</b>			
Male	80 (49.7%)	17 (39.5%)	0.236
Female	81 (50.3%)	26 (60.5%)	
Duration of Ganglion	10.14 $\pm$ 3.89	9.81 $\pm$ 3.13	0.353
<b>Size</b>			
<10mm	7 (4.3%)	0 (0%)	0.375
10-20 mm	102 (63.4%)	29 (67.4%)	
20-30 mm	48 (29.8%)	14 (32.6%)	
>30 mm	4 (2.5%)	0 (0%)	
<b>Surgeon</b>			
Surgeon 1	53 (32.9%)	15 (34.9%)	0.889
Surgeon 2	53 (32.9%)	15 (34.9%)	
Surgeon 3	55 (34.2%)	13 (30.2%)	

The presence of swelling was present in every case. Mild discomfort was present in 137(67.16%) cases, and cosmetic concern was noted in 116(56.86%) patients. The range of motion was affected in 26 (12.75%) patients, whereas an apprehension of the tumour was noted in only 12(5.88%) cases. The duration of symptoms was  $10.07 \pm 3.74$  months. The mean VAS for pain was  $1.33 \pm 0.47$ , and it was not more than four. There was no difference in the recurrence rates between Group-A (n=7, 4.35%) and Group-B (n=2, 4.65%, *p*=0.931)



**Figure - SETON Treatment of Wrist Ganglion**

**DISCUSSION**

Ganglions around the wrist are the most frequent cause of referral to surgeons. The management of asymptomatic ganglions is expectant, whereas treatment for symptomatic ganglions can be as simple as hitting with a blow to advanced arthroscopic excision. Each management option has its own merits and demerits.

In our study, swelling around the wrist was the primary complaint, followed by pain and esthetics. Mild pain was reported in 137(67.15%; VAS <4) and cosmetic concerns in 116(56.86%) patients. The average duration of the swelling was less ( $10.07 \pm 3.744$  months) than the average ( $15.28 \pm 4.85$  months) reported by Saaq et al.<sup>11</sup> The majority of the ganglions (n=193, 94.6%) were between 1-3cm, consistent with the findings of Khan *et al.*<sup>12</sup> Ganglion size in the right hand (18mm) was slightly less compared to the left (20mm). Moreover, the right-sided ganglions were (n=113, 55.4%) of the total because patients prefer to take treatment for the ones causing more trouble.<sup>11,13</sup>

Surgical excision remains the gold standard and the treatment of choice when conservative treatment fails.<sup>14</sup> However, it has its complications: permanent scarring and post-operative pain.<sup>15</sup> We observed a 4.88% recurrence six months after open surgery.

Arthroscopic ganglion treatment is the latest trend but requires dedicated surgeons and set-ups, but

these set-ups are sparse, and recurrence is inevitable.<sup>16,17</sup> In order to overcome complications, new treatment modalities are being sought. The recurrence rate of hitting the ganglion with a blunt force is variable and can be up to 44.7%. There are wide variations of aspiration techniques to reduce the recurrence; recurrence with aspiration alone is 15%-69% while aspiration followed by steroid injection is 6%-84%.<sup>18,19</sup>

Ideally, our study should have been longer to record recurrences, although most ganglions reoccur within six months. A 1-2 year follow-up would have resulted in a very large number of cases to be lost to follow-up. Nonetheless, all ganglion treatments are cost-effective and efficient.

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#### CONCLUSION

Seton treatment is the recommended treatment for patients with a ganglion. This procedure is simple, cost-effective, efficient and easy to master. However, surgery should be reserved for severe cases, with a warning for the patients about the potential side effects and the chance of recurrence.

**Conflict of Interest:** None.

#### Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

BS & JSU: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

MA & MS: Data acquisition, data analysis, approval of the final version to be published.

AS & SRT: Critical review, concept, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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